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ANNUAL PROGRESS REPORT

GRANT#: N00014-91-J-1455 R&T PROJECT: uri5303-9101

PRINCIPAL INVESTIGATOR: C. Anthony Hunt
CO-INVESTIGATOR: Roderick D. MacGregor

INSTITUTION: University of California, San Francisco

GRANT TITLE: Synthesis of a Self-Assembling Supramolecular Lattice

REPORTING PERIOD: 01 May 1991 - 01 June 1991

AWARD PERIOD: 01 May 1991 - 30 April 1994

OBJECTIVE: The goal of this project is to construct a self-assembling, closed, hollow, uniform, supramolecular lattice in which the lattice dimensions measure between 10 and 100 nm, and which exhibits two hierarchical levels of molecular order. Our approach is novel. Use the membrane skeleton of erythrocytes, which is an ordered, two dimensional molecular lattice, as a template to construct a synthetic lattice that remains intact, functional and responsive after removal of the template.

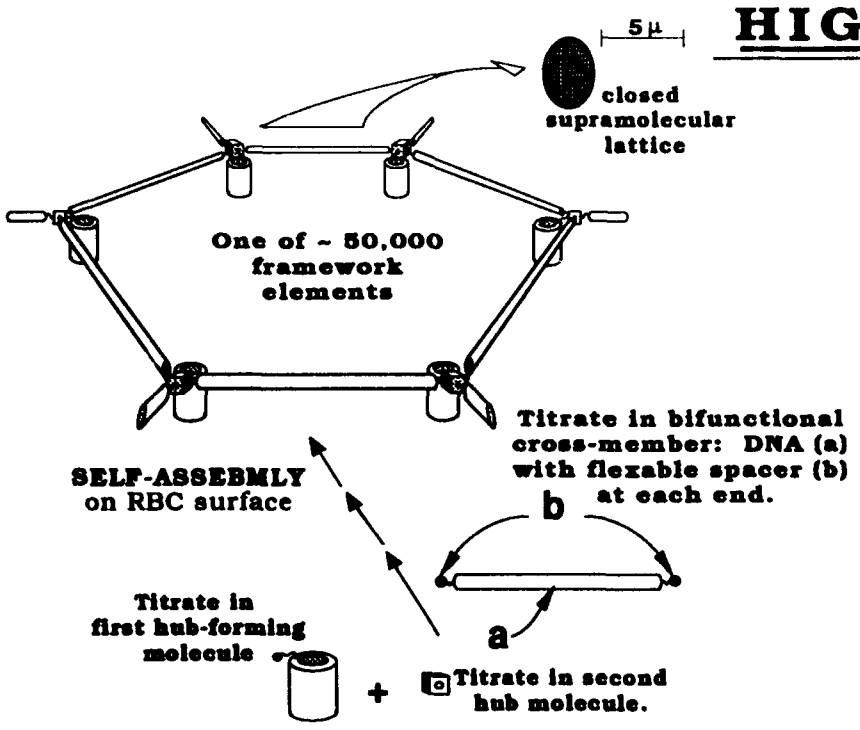
ACCOMPLISHMENTS: In the one month this project has been funded we have initiated work on the project, refined our initial experimental approach, begun evaluating options for the first hub molecule, and have interviewed and hired a Post Doctoral Scientist to work on the project starting in July.

SIGNIFICANCE: If this project is successful we will gain basic knowledge of cell membrane structure, function and assembly, and will construct a synthetic, self-assembling, closed, hollow, uniform, supramolecular lattice. The lattices are expected to possess unique materials properties.

WORK PLAN (next 12 months): Work on this project is just beginning. The first objective is to contrast the observed and model-predicted binding of model hub molecules to normal erythrocytes and to erythrocytes having abnormal membrane skeletons. This will require the preparation and purification of at least three candidate hub molecules. The candidate hub-forming molecule which best exhibits the quantal behavior predicted by our newly developed corralled membrane model will be selected to become the hub-forming molecule.

PUBLICATIONS AND REPORTS (last 1 month): None.

HIGHLIGHTS



OBJECTIVES

Construct a self-assembling, closed, hollow, uniform, supramolecular lattice (between 10 & 100 nm). Use the RBC outer membrane surface and the membrane skeleton as a template to construct the lattice.

ACCOMPLISHMENTS

- **Refined initial experimental approach.**
- **Evaluating options for first hub molecule.**
- **Hired post-doctoral scientist.**

SIGNIFICANCE

- **New knowledge of cell membrane structure, function and assembly.**
- **A self-assembling, closed, hollow, uniform, supramolecular lattice ?**

A. Hunt and R. MacGregor, UCSF, 1991

Annual Report Questionnaire
(not circulated outside ONR)

Principal Investigator: C. Anthony Hunt

Institution: University of California, San Francisco

Grant title: Synthesis of a Self-Assembling Supramolecular Lattice

Reporting period: 01 May 1991 - 01 June 1991

Number of ONR supported

Papers published in refereed journals: none

Technical reports or non-refereed papers: none

Books or chapters published: none

Number of ONR supported patents/inventions

Filed: none

Granted: none

Number of Presentations

Invited: none

Contributed: none

	Total	Female	Minority	Non-US citizen
Number of graduate students:	none			
Number of postdoctoral fellows:	1	1	1	1

Start date: 01 July 1991

Awards/Honors to PI and/or to members of PI's research group (please describe): none

Equipment purchased (number and description of items >$1500): none

Your Email address: none

Our Email address on Internet is: onrbio@ccf3.nrl.navy.mil
This address can be reached via Arpanet or Bitnet. We read our mail daily.